PACING GUIDE SCIENCE
Grade 7

Topic	Unit	Marking Period	Number of Days
From Molecules to Organisms: Structures and Processes	Fusion 7th Module A Cells 33	1	33
Ecosystems: Interactions, Energy, and Dynamics	Fusion 7th Module D 60	3	60
Heredity: Inheritance and Variation of Traits	Fusion 7th Module A Reproduction and Heredity 35	1	35
Biological Evolution: Unity and Diversity	Fusion 7th Module B 39	2	39
Engineering Design	Fusion Module K	1-4	13

Alpha Public School
Science Curriculum Map

Grade: 7th

Standard: MS-LS1	**Content Topic:** From Molecules to Organisms: Structures and Processes

Strand	Disciplinary Core Ideas / Essential Statement	Objective	Science & Engineering Practices / Skills & Lesson
MS-LS1-1	---All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular) (LS1.A)	Conduct an investigation to provide evidence that living things are made of cells: either one cell or many different numbers and types of cells	---conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation Cells the Basic Building Blocks of Life-Better Lessons https://betterlesson.com/search?salt=f9f838ef21&standards=2216
MS-LS1-2	---Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell (LS1.A)	Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function	---develop and use a model to describe phenomena **Osmosis and Diffusion Lab**
MS-LS1-3	---In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions (LS1.A)	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells	---use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon **Interacting Systems Lab** Balancing Act Power in Pairs Speed of a Reflex Model a Lung Clogged Arteries Modeling a Kidney Measuring Reaction Time Dissection
MS-LS1-4	---Animals engage in characteristic behaviors that	Use argument based on empirical evidence and scientific reasoning to	---use an oral and written argument supported by

	increase the odds of reproduction (LS1.B) Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction (LS1.B)	support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively	empirical evidence and scientific reasoning to support or refute an explanation or model for a phenomenon or a solution to a problem **STEM-Grow and Fertilize a Plant Project** **The Zoo Under Construction Better Lessons** **https://betterlesson.com/lesson/632613/the-zoo-under-construction?from=search**
MS-LS1-5	---Genetic factors as well as local conditions affect the growth of the adult plant (LS1.B)	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms	---Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future Ecosystem Match Up-Better Lessons https://betterlesson.com/lesson/631890/ecosystem-match-up?from=search The Bird and the Beak-Better Lessons https://betterlesson.com/lesson/631891/the-birds-and-the-beaks?from=search More Than Manure https://betterlesson.com/lesson/632172/more-than-manure?from=search
MS-LS1-6	---Plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen. These sugars can be used immediately or	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms	---Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future

	stored for growth or later use (LS1.C) ----The chemical reaction by which plants produce complex food molecules (sugars) requires an energy input (i.e., from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon-based organic molecules and release oxygen (PS3.D)		Photosynthesis A WISE Activity Day 1-Better Lessons https://betterlesson.com/lesson/629921/photosynthesis-a-wise-activity-day-1?from=search Photosynthesis A WISE Activity Day 2 https://betterlesson.com/lesson/630077/photosynthesis-a-wise-activity-day-2?from=search
MS-LS1-7	---Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy (LS1.C) ---Cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials (PS3.D)	Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and / or release energy as this matter moves through an organism	---develop a model to describe unobservable mechanisms Mitochondria The PowerHouse of the Cell-Better Lessons https://betterlesson.com/lesson/627995/mitochondria-the-powerhouse-of-the-cell?from=search Cellular Respiration A WISE Activity Day 4 https://betterlesson.com/lesson/630450/cell-respiration-a-wise-activity-day-4?from=search Cellular Respiration A WISE Activity Day 5 https://betterlesson.com/lesson/630478/cell-respiration-a-wise-activity-day-5?from=search
MS-LS1-8	---Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories (LS1.D)	Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories	---gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence What are the Effects of Multitasking https://betterlesson.com/lesson/628935/what-are-the-effects-of-multitasking?from=search

Formative, Summative and	Benchmark Assessments	Core Instructional and

Alternative Assessments		Supplemental Materials (including various texts at each grade level)
Unit Tests in 2 formats Visualizing and Verbalizing Quizzes for each section Marzano Vocabulary Slides Formative Assessment Questions on every page of text Probing Questions on every page Why It Matters Text to Life Questions Alternative Assessment- Alternative Assessment Science Fusion for every section Test Doctor for every assessment 1-3 Performance Based Quick Labs for every lessons: Suitable labs Using a Microscope to Explore Cells My School Is Like a Cell Making a 3D cell model and relate it to cell size 2 experiments Hitchhikers guide to the Human Body Reproduction Animal Behaviors that increase chances of reproduction Flowers Seeking Pollinators Plants reproduce a variety of ways to ensure reproduction Effect of the Environment on Plant Growth Photosynthesis Plant's Greatest Gift Starch Test Analyzing Cell Components-Lipids Information Processing-Multitasking Dissection of a worm / frog Essay comparing similarities and differences between systems	End of the Module Test Use of portfolio assessments and rubric Performance Based Assessments for every unit	Text: Science Fusion Holt: Science Middle School Chemistry Better Lessons Khan Academy Edpuzzle

Alternative Assessments- Alternative Assessments Science Fusion Work dissection video Gel based frog model with 3D printed internal organisms		

Technology	Crosscutting Concepts / Interdisciplinary Connections across grade levels and content areas (at least 1)
• Book Available On line • Lab Posted on Google Classroom and done in Kami • Middle School Chemistry Multimedia Animations https://www.middleschoolchemistry.com/ • Better Lessons https://betterlesson.com/search?from=mtp_intro&types=lesson&subjects=2 • Khan Academy https://www.khanacademy.org/ • Bozeman Science http://www.bozemanscience.com/next-generation-science-standards • Quizlet	---Phenomena that can be observed at one scale may not be observable at another scale ---engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. ---complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures / systems can be analyzed to determine how they function ---systems may interact with other systems; they may have sub-systems and be a part of larger complex systems ---scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas ---Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability ---within a natural system, the transfer of energy drives the motion and / or cycling of matter ----science knowledge is based upon logical connections between evidence and explanations ---matter is conserved because atoms are conserved in physical and chemical processes ---cause and effect relationships may be used to predict phenomena in natural systems

Differentiation (IEPs / 504s)	Differentiation (ELL)	Differentiation (G &T)
Visual aids	Visual aids	Independent research projects

Sentence Frames Modeling Anchor charts Modify rubric Teacher directed grouping Chunk learning at teacher discretion Re-read text at teacher discretion Text in auditory format	Sentence Frames Modeling Anchor charts Modify rubric Teacher directed grouping Chunk learning at teacher discretion Re-read text at teacher discretion Text in auditory format Pre-teach vocabulary Non-linguistic cues Manipulatives Graphic organizers Use of educational websites: www.khanacademy.org www.colorincolorado.org/	Advanced texts http://education.jlab.org/vocabhangman/ Science content vocabulary hangman http://kids.nationalgeographic.com/ National Geographic online http://www.bbc.co.uk/schools/scienceclips/ages/10_11/science_10_11.shtml Interactive science activities http://classroom.jc-schools.net/sci-units/plants-animals.htm#Interactive

21st Century Education	Career Education
THEMES: Global Awareness Financial, Economic, Business and Entrepreneurial Literacy Civic Literacy Health Literacy SKILLS: Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information Literacy Media Literacy ICT Literacy Life and Career Skills	Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study. CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.

Alpha Public School
Science Curriculum Map

Standard: MS-LS2	**Content Topic:** Ecosystems: Interactions, Energy and Dynamics

Strand	Disciplinary Core Ideas / Essential Statement	Objective	Science & Engineering Practices / Skills & Lesson
MS-LS2-1	---Organisms are populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors (LS2.A) ---In any ecosystem, organisms and populations with similar requirements for food,water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction (LS2.A) ---Growth of organisms and population increases are limited by access to resources (LS2.A)	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem	---Analyze and interpret data to provide evidence for phenomena Which Niche? https://betterlesson.com/lesson/631887/which-niche?from=search
MS-LS2-2	---Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared (LS2.A)	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems	---Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena Which Niche? https://betterlesson.com/lesson/631887/which-niche?from=search
MS-LS2-3	---Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem	---Develop a model to describe phenomena Which Niche? https://betterlesson.com/lesson/631887/which-niche?from=search

	groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem (LS2.B).		
MS-LS2-4	---Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component on an ecosystem can lead to shifts in all its population (LS2.C)	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations	---Construct an oral and written arguments supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem Mystery Features Discovered-Ahh It's a Spider https://betterlesson.com/lesson/629017/mystery-creatures-discovered-aaahhh-it-s-a-spider?from=search
MS-LS2-5	---Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystems' biodiversity is often used as a measure of its heath (LS2.C) ---Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on- for example, water purification and recycling (LS4.D) ----There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem (ETS1.B)	Evaluate competing design solutions for maintaining biodiversity and ecosystem services	---evaluate competing design solutions based on jointly developed and agreed-upon design criteria Mystery Features Discovered-Ahh It's a Spider https://betterlesson.com/lesson/629017/mystery-creatures-discovered-aaahhh-it-s-a-spider?from=search

Formative, Summative and Alternative Assessments	Benchmark Assessments	Core Instructional and Supplemental Materials (including various texts at each grade level)
Unit Tests in 2 formats Visualizing and Verbalizing Quizzes for each section Marzano Vocabulary Slides Formative Assessment Questions on every page of text Probing Questions on every page Why It Matters Text to Life Questions **Alternative Assessment**- Alternative Assessment Science Fusion for every section Test Doctor for every assessment 1-3 Performance Based Quick Labs for every lessons: Investigate Effects of Limited Resources? along with Analyze population growth data Analyze Population Growth Data Alternative Assessment- Alternative Assessment Science Fusion	End of the Module Test Use of portfolio assessments and rubric Performance Based Assessments for every unit	Text: Science Fusion Holt: Science Middle School Chemistry Better Lessons Khan Academy Edpuzzle

Technology	Crosscutting Concepts / Interdisciplinary Connections across grade levels and content areas (at least 1)
• Book Available On line • Lab Posted on Google Classroom and done in Kami • Better Lessons https://betterlesson.com/search?from=mtp_intro&types=lesson&subjects=2 • Khan Academy https://www.khanacademy.org/ • Bozeman Science http://www.bozemanscience.com/next-generation-science-standards	---Cause and effect relationships may be used to predict phenomena in natural or designed systems ---Patterns can be used to identify cause and effect relationships ---The transfer of energy can be tracked as energy flows through a natural system ---Science assumes that objects are events in natural systems occur in consistent patterns that are understandable through measurement and observation ---Small changes in one part of a system might cause large changes in other part

• Quizlet	---Science disciplines share common rules of obtaining and evaluating empirical evidence ---Small changes in one part of a system might cause large changes in other part ---The use of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus, technology use varies from region to region and over time ---Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes

Differentiation (IEPs / 504s)	Differentiation (ELL)	Differentiation (G &T)
Visual aids Sentence Frames Modeling Anchor charts Modify rubric Teacher directed grouping Chunk learning at teacher discretion Re-read text at teacher discretion Text in auditory format	Visual aids Sentence Frames Modeling Anchor charts Modify rubric Teacher directed grouping Chunk learning at teacher discretion Re-read text at teacher discretion Text in auditory format Pre-teach vocabulary Non-linguistic cues Manipulatives Graphic organizers Use of educational websites: www.khanacademy.org www.colorincolorado.org/	Independent research projects Advanced texts http://education.jlab.org/vocabhangman/ Science content vocabulary hangman http://kids.nationalgeographic.com/ National Geographic online http://www.bbc.co.uk/schools/scienceclips/ages/10_11/science_10_11.shtml Interactive science activities http://classroom.jc-schools.net/sci-units/plants-animals.htm#Interactive

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THEMES: Global Awareness Financial, Economic, Business and Entrepreneurial Literacy Civic Literacy Health Literacy SKILLS: Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information Literacy Media Literacy ICT Literacy Life and Career Skills	Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study. CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.

Standard: MS-LS3	**Content Topic:** Heredity: Inheritance and Variation of Traits

Strand	Disciplinary Core Ideas / Essential Statement	Objective	Science & Engineering Practices / Skills & Lesson
MS-LS3-1	---Genes are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes. Each distinct gene chiefly controls the production of specific proteins, which in turn affects the traits of the individual. Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby change traits (LS3.A) ---In addition to variations that arise from sexual reproduction, genetic information can be altered because of mutations. Though rare, mutations may result in changes to the structure and function of proteins. Some changes are beneficial, others harmful, and some neutral to the organism (LS3.B)	Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.	---develop and use a model to describe phenomena Reading DNA Transcription https://betterlesson.com/lesson/633817/reading-dna-transcription?from=search
MS-LS3-2	---Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring (LS1.B) ---Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited (LS3.A) ---In sexually reproducing	Develop and use a model to desribe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.	---develop and use a model to describe phenomena Reading DNA Transcription https://betterlesson.com/lesson/633817/reading-dna-transcription?from=search

	organisms, each parent contributes half of the genes acquired (at random) by the offspring. Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other (LS3.B)		

Formative, Summative and Alternative Assessments	Benchmark Assessments	Core Instructional and Supplemental Materials (including various texts at each grade level)
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Technology	Crosscutting Concepts / Interdisciplinary Connections across grade levels and content areas (at least 1)
● Book Available On line ● Lab Posted on Google Classroom and done in Kami ● Better Lessons https://betterlesson.com/search?from=mtp_intr	---Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the shapes, composition, and relationships among its parts, therefore complex natural structures / systems can be analyzed to determine how they function ---Cause and effect relationships may be used to predict phenomena in natural systems

Differentiation (IEPs / 504s)	Differentiation (ELL)	Differentiation (G &T)
Visual aids Sentence Frames Modeling Anchor charts Modify rubric Teacher directed grouping Chunk learning at teacher discretion Re-read text at teacher discretion Text in auditory format	Visual aids Sentence Frames Modeling Anchor charts Modify rubric Teacher directed grouping Chunk learning at teacher discretion Re-read text at teacher discretion Text in auditory format Pre-teach vocabulary Non-linguistic cues Manipulatives Graphic organizers Use of educational websites: www.khanacademy.org www.colorincolorado.org/	Independent research projects Advanced texts http://education.jlab.org/vocabhangman/ Science content vocabulary hangman http://kids.nationalgeographic.com/ National Geographic online http://www.bbc.co.uk/schools/scienceclips/ages/10_11/science_10_11.shtml Interactive science activities http://classroom.jc-schools.net/sci-units/plants-animals.htm#Interactive

21st Century Education	Career Education
THEMES: Global Awareness Financial, Economic, Business and Entrepreneurial Literacy Civic Literacy Health Literacy SKILLS: Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information Literacy Media Literacy ICT Literacy Life and Career Skills	Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study. CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal

	goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.

Standard: MS-LS4	**Content Topic:** Biological Evolution: Unity and Diversity

Strand	Disciplinary Core Ideas / Essential Statement	Objective	Science & Engineering Practices / Skills & Lesson
MS-LS4-1	---The collection of fossils and their placement in chronological order (e.g., through the location of the sedimentary layers in which they are found or through radioactive dating) is known as the fossil record. It documents the existence, diversity, extinction, and change of many life forms throughout the history of life on Earth (LS4.A)	Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past	---Analyze and interpret data to determine similarities and differences in findings. Can You Dig It? https://betterlesson.com/lesson/631923/can-you-dig-it?from=search
MS-LS4-2	---Anatomical similarities and differences between various organisms living today and between them and organisms in the fossil record, enable the reconstruction of evolutionary history and the inference of lines of evolutionary descent (LS4.A)	Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships	---apply scientific ideas to construct an explanation for real-world phenomena, examples, or events Can You Dig It? https://betterlesson.com/lesson/631923/can-you-dig-it?from=search
MS-LS4-3	---Comparison of the embryological development of different species also reveals similarities that show relationships not evident in the fully-formed anatomy (LS4.A)	Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy	---analyze displays of data to identify linear and nonlinear relationships Embryos, Animals, and Evolution https://betterlesson.com/lesson/634790/embryos-animals-and-evolution?from=search
MS-LS4-4	---Natural selection leads to the predominance of certain traits in a population, and the suppression of others (LS4.B)	Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving	---construct an explanation that includes qualitative and quantitative relationships between variables that describe phenomena Is It the End of Humanity?

		and reproducing in a specific environment	https://betterlesson.com/lesson/635476/introduction-of-pbl-is-it-the-end-of-humanity?from=search
MS-LS4-5	---In *artificial* selection, humans have the capacity to influence certain characteristics of organisms by selective breeding. One can choose desired parental traits determined by genes, which are then passed on to offspring (LS4.B)	Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms	---Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence It It the End of Humanity? https://betterlesson.com/lesson/635476/introduction-of-pbl-is-it-the-end-of-humanity?from=search
MS-LS4-6	---Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common, those that do not become less common. Thus, the distribution of traits in a population changes. (LS4.C)	Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time	---use mathematical representations to support scientific conclusions and design solutions How Does Color Help an Animal Survive? https://betterlesson.com/lesson/632615/how-does-color-help-an-animal-to-survive?from=search

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1-3 Performance Based Quick Labs for every lessons: Suitable Labs Model natural selection in a population Model the Genetic Basis for Artificial Selection Do the Math for Artificial Selection Alternative Assessment- Alternative Assessment Science Fusion		

Technology	Crosscutting Concepts / Interdisciplinary Connections across grade levels and content areas (at least 1)
• Book Available On line • Lab Posted on Google Classroom and done in Kami • Middle School Chemistry Multimedia Animations https://www.middleschoolchemistry.com/ • Better Lessons https://betterlesson.com/search?from=mtp_intro&types=lesson&subjects=2 • Khan Academy https://www.khanacademy.org/ • Bozeman Science http://www.bozemanscience.com/next-generation-science-standards • Quizlet	---Science knowledge is based upon logical and conceptual connections between evidence and explanations ---Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation ---graphs, charts, and images can be used to identify patterns in data ---patterns can be used to identify cause and effect relationships ---phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability ---Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems ----Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes

Differentiation (IEPs / 504s)	Differentiation (ELL)	Differentiation (G &T)
Visual aids	Visual aids	Independent research projects

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THEMES: Global Awareness Financial, Economic, Business and Entrepreneurial Literacy Civic Literacy Health Literacy SKILLS: Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information Literacy Media Literacy ICT Literacy Life and Career Skills	Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study. CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.

Standard: MS-ETS1	**Content Topic:** Engineering Design

Strand	Disciplinary Core Ideas / Essential Statement	Objective	Science & Engineering Practices / Skills & Lesson
MS-ETS1-1	---The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions (ETS1.A)	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions	STEM Project-Exploring Convection Fusion Science and Technology
MS-ETS1-2	---There are systematic processes for evaluation solutions with respect to how well they meet the criteria and constraints of a problem (ETS1.B)	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem	STEM Project-Exploring Convection Fusion Science and Technology
MS-ETS1-3	---There are systematic processes for evaluation solutions with respect to how well they meet the criteria and constraints of a problem (ETS1.B) ---Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors (ETS1.B) ---Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process---that is, some of those characteristics may be incorporated into the new design (ETS1.C)	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success	STEM Project-Exploring Convection Fusion Science and Technology

MS-ET1-4	---A solution needs to be tested, and then modified on the basis of the test results, in order to improve it (ETS1.B) ---Models of all kinds are important for testing solutions (ETS1.B) ---The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution (ETS1.C)	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved	STEM Project-Exploring Convection Fusion Science and Technology

Formative, Summative and Alternative Assessments	Benchmark Assessments	Core Instructional and Supplemental Materials (including various texts at each grade level)
Unit Tests in 2 formats Visualizing and Verbalizing Quizzes for each section Marzano Vocabulary Slides Formative Assessment Questions on every page of text Probing Questions on every page Why It Matters Text to Life Questions Alternative Assessment- Alternative Assessment Science Fusion for every section Test Doctor for every assessment 1-3 Performance Based Quick Labs for every lessons: Lab-What's in the Box Lab-Which Scientist Am I? Modeling Eye Images Interpreting Models Designing a Procedure to test whether plants grow toward the light Modeling Heights of Students Investigating Water Usage Investigating Density	End of the Module Test Use of portfolio assessments and rubric Performance Based Assessments for every unit	Text: Science Fusion Holt: Science Middle School Chemistry Better Lessons Khan Academy Edpuzzle

Alternative Assessment- Alternative Assessment Book- Science Fusion		

Technology	Crosscutting Concepts / Interdisciplinary Connections across grade levels and content areas (at least 1)
• Book Available On line • Lab Posted on Google Classroom and done in Kami • Better Lessons https://betterlesson.com/search?from=mtp_intro&types=lesson&subjects=2 • Khan Academy https://www.khanacademy.org/ • Bozeman Science http://www.bozemanscience.com/next-generation-science-standards • Quizlet	---all human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment ---The uses of technologies and limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources and economic conditions

Differentiation (IEPs / 504s)	Differentiation (ELL)	Differentiation (G &T)
Visual aids Sentence Frames Modeling Anchor charts Modify rubric Teacher directed grouping Chunk learning at teacher discretion Re-read text at teacher discretion Text in auditory format	Visual aids Sentence Frames Modeling Anchor charts Modify rubric Teacher directed grouping Chunk learning at teacher discretion Re-read text at teacher discretion Text in auditory format Pre-teach vocabulary Non-linguistic cues Manipulatives Graphic organizers	Independent research projects Advanced texts http://education.jlab.org/vocabhangman/ Science content vocabulary hangman http://kids.nationalgeographic.com/ National Geographic online http://www.bbc.co.uk/schools/scienceclips/ages/10_11/science_10_11.shtml Interactive science activities http://classroom.jc-schools.net/sci-units/plants-animals.htm#Interactive

	Use of educational websites: www.khanacademy.org www.colorincolorado.org/	

21st Century Education	Career Education
THEMES: Global Awareness Financial, Economic, Business and Entrepreneurial Literacy Civic Literacy Health Literacy SKILLS: Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information Literacy Media Literacy ICT Literacy Life and Career Skills	Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study. CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP3. Attend to personal health and financial well-being. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.